

THE EVOLVING SOFT X-RAY FLUX OF SN1987A

NASA Grant NAG5-2233

Final Report

For the Period 1 April 1993 through 31 March 1995

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August 1995

Prepared for:

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

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The Smithsonian Astrophysical Observatory
is a member of the
Harvard-Smithsonian Center for Astrophysics

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N95-71704

Unclas

Z9/89 0064850

(NASA-CR-199270) THE EVOLVING SOFT
X-RAY FLUX OF SN1987A Final Report,
1 Apr. 1993 - 31 Mar. 1995
(Smithsonian Astrophysical
Observatory) 4 p

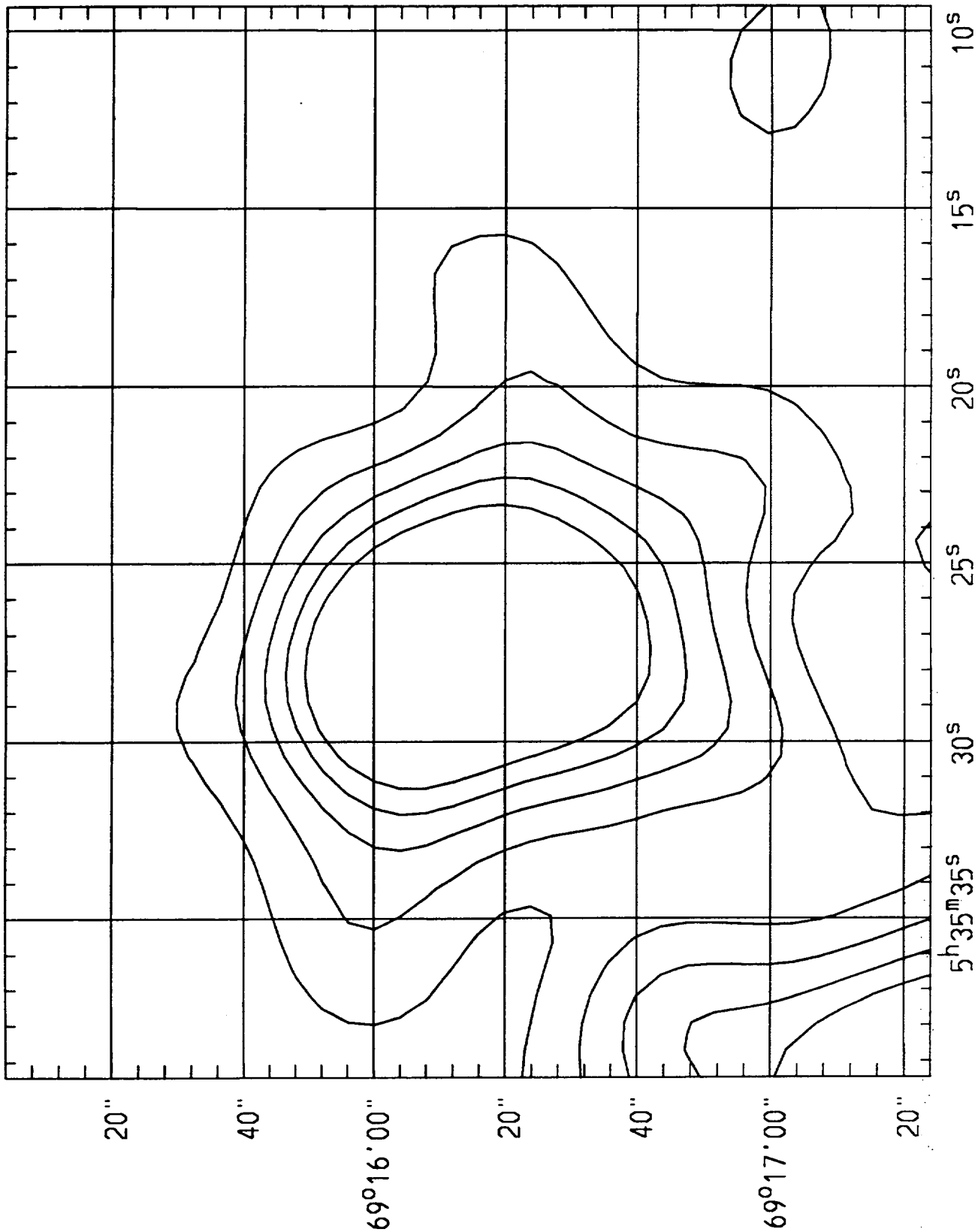
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p. 4

The supernova that occurred in the Large Magellanic Cloud in February 1987 was detected in soft X-rays from ROSAT several times over the course of the subsequent 6 years. Its X-ray brightness is expected to evolve moderately but the details and even the direction of the early evolution are difficult to predict. This will change when a certain event occurs about 15 years from now. SN 1987A is expected to experience a dramatic increase in X-ray brightness when the fast moving ejecta from the explosion first overtakes a slow moving high density medium that was produced by the pre-supernova star more than 20,000 years ago when it was in the red giant phase. The purpose of this measurement was to obtain another image of the source during the early phase of moderate evolution.

The AO3 measurement consists of two series of exposures each totaling about ten thousand seconds. One was taken between 7 April and 10 April 1993 and the second was accumulated between 20 June and 5 July 1993. The image is shown as a contour map in Fig. 1. SN 1987A was definitely detected and about at the same flux level as the AO2 epoch (6 October 1991 and 12-14 May 1992) whose results were described by Gorenstein, Hughes, and Tucker (Ap. J. 1994 420, L25). Again the source appears to be extended but the image appears to differ in detail from the previous one. The phenomenon of an image change is not in disagreement with the model of Gorenstein, Hughes, and Tucker, 1994 who suggested that some of the contribution is due to a light echo effect. Light echos from SN 1987A have been seen in the visible region. An X-ray light echo is a component that arises from

SN1987A

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Field Center:
05^h35^m24.75^s
-69°16'14.00"

Scale: 0.88"/mm
X/Y Ratio: 1.00

Contour Levels:
0.4000
0.3500
0.3000
0.2500
0.2000

